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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/685,195	10/10/2000	Timothy K. Miller	195269US-8	4305

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EXAMINER

LIU, SHUWANG

ART UNIT

PAPER NUMBER

2634

DATE MAILED: 03/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/685,195

Applicant(s)

MILLER ET AL.

Examiner

Shuwang Liu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2003.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-17 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments regarding claims 1, 8 and 15 filed 12/23/03 have been fully considered but they are not persuasive.

The Examiner has thoroughly reviewed Applicant's arguments but firmly believes that the cited reference reasonably and properly meet the claimed limitation as rejected.

(1) Applicant's argument – regarding claims 1, 8, 15, the reference provides no teaching or suggestion that pulses be generated a fixed interval.

Examiner's response – see figure 2 a of Richards et al..

(2) Applicant's argument – regarding claim 7 and 14.

Examiner's response – see column 10, lines 26-34 of Kaku.

2. Applicant's arguments with respect to claims 3 and 10 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 4-6, 8, 9, 11-13 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al. (US 6,556,621) in view of Raphaeli et al. (US 6,614,864).

As shown in figures 1A, 2A, 4, 5, 8, 10-12 and 15, Richards et al. disclosed:

(1) regarding claims 1, 8 and 15:

a method and a system for identifying a phase of an incoming UWB signal at a UWB receiver, comprising the steps of:

receiving incoming pulses of the incoming UWB signal (706 in figure 7), adjacent pulses of said incoming pulses arriving at a fixed interval (column 4, lines 28-67, column 5, line 1-column 6, line 10 and 404 in figure 5, figure 2A);

generating local pulses (730) at the UWB receiver;

correlating (710) the local pulses with the incoming pulses to produce a correlation function; and

determining if the correlation function (result) exceeds the threshold for a lock condition (synchronization) (steps 4-14 in figure 10).

Richards et al. discloses all of the subject matter as described above except for specifically teaching determining a maximum of the correlation function as claimed.

Raphaeli et al., in the same field of endeavor, teaches a method for acquiring synchronization, wherein once the correlation result (function) exceeds the threshold, the maximum of the correlation function is determined (figure 4, and 98 in figure 5, column 17, lines 25-60). That is, the maximum of the correlation function is determined by the exceeding the threshold during the acquiring synchronization.

It is well known that the maximum of the correlation function is determined by checking if the correlation function exceeds the threshold value. The well-known method to determine the maximum of the correlation provides for a more reliable communication in the presence of high narrowband noise, spectral distortion and pulse noise and can be utilized to identify an incoming received signal more quick and efficient. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to determine the maximum correlation by a threshold as taught by Raphaeli et al. in the acquiring synchronization of Richard et al. in order to allow the receiver to demodulate UWB signal more quick and efficient and provide a more reliable communication in the presence of high narrowband noise, spectral distortion and pulse noise.

(2) regarding claims 2 and 9:

wherein the fixed interval is the time between the incoming pulses (column 4, lines 28-67, column 5, line 1-column 6, line 10 and 404 in figure 5).

(3) regarding claims 4 and 11:

wherein the incoming pulses are multilevel pulses (column 7, lines 1-15).

(4) regarding claims 5 and 12:

wherein the step of correlating the incoming pulses with the local pulses to produce a correlation function comprises:

shifting a phase of the local pulses (48 in figure 15); and

calculating a correlation value of the local pulses and the incoming pulses (49).

(5) regarding claims 6 and 13:

wherein the correlation value comprises the correlation function (49 and 50).

(6) regarding claims 16 and 17:

wherein the local pulse are generated at the fixed interval, but a variable phase with respect to the incoming pulses (column 6, line 42-column 9, line25).

5. Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al. (US 6,556,621) and Raphaeli et al. (US 6,614,864) as applied to claims 1 and 8 above, and further in view of Kaku (US 5,812,593).

It is inherent in the determining maximum processing that finding a first maximum and analyzing the correlation function to find a second maximum that exceeds the first maximum as recited in claims since there is only one maximum in the correlation function. For example, Raphaeli et al. teaches finding a first maximum and analyzing the correlation function to find a second maximum that exceeds the first maximum during the determining a maximum of the correlation function (60 in figure 4). However, Richards et al. and Raphaeli et al. does not disclose searching a region around the second maximum to determine if the second maximum is a true maximum.

Kaku, in the same field of endeavor, teaches a method searching a region around the second maximum to determine if the second maximum is a true maximum (column 4, lines 23-27 and column 6, line 60-column 8, line 38).

It is desirable to improve the resolution of the demodulation result by using searching processing during the synchronization so as to provides a more reliable communication in the presence of multipath signals. Therefore, it would have been

obvious to one of ordinary skill in the art at the time of the invention to use the search processing as taught by Kaku in the acquiring synchronization of Richard et al. and Raphaeli et al. in order to allow the receiver to improve the resolution of the demodulation result and provide a more reliable communication in the presence of multipath signals.

6. Claims 3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richards et al. (US 6,556,621) and Raphaeli et al. (US 6,614,864) as applied to claims 1 and 8 above, and further in view of Johnson et al. (US 5,289,476).

Richards et al. discloses all of the subject matter as described above except for specifically teaching the phase modulation comprising at least one of bi-phase modulation (BPSK), and quadrature phase modulation (QPSK).

Johnson et al. teaches the phase modulation commonly comprising BPSK and QPSK (column 1, lines 11-62).

It is well known that BPSK and QPSK are commonly used. In the a BPSK system, there are two phases: an in-phase signal and 180° out of phase signal. In a QPSK system, there four phases. One skilled in the art would have clearly recognized that the nature of various of modulation that can be selected is dependent on the respective application. As taught by Johnson et al., the QPSK modulation can be used when low levels of interference allow fast transmission; The BPSK modulation may be used when greater reliability is necessary in a noise environment (column 2, lines 23-32). Therefore, it would have been obvious to one of ordinary skill in the art at the time

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of the invention to use BPSK or QPSK as taught by Johnson et al. in the system of Richard et al. in order to achieve fast transmission by using BPSK or achieve greater reliability in a noise environment by using QPSK.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shuwang Liu whose telephone number is (703) 308-9556.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin, can be reached at (703) 305-4714.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

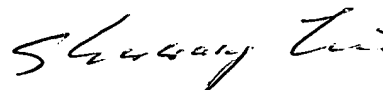
or faxed to:

(703) 872-9306 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.



Shuwang Liu
Primary Examiner
Art Unit 2634

March 13, 2004